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EXPLORING THE INFLUENCE OF GENDERED RACISM ON CORTISOL ACTIVITY AMONG AFRICAN AMERICAN WOMEN

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I am submitting herewith a thesis written by Erica J. Peppers entitled "EXPLORING THE INFLUENCE OF GENDERED RACISM ON CORTISOL ACTIVITY AMONG AFRICAN AMERICAN WOMEN." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts, with a major in Psychology.

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**EXPLORING THE INFLUENCE OF GENDERED RACISM ON CORTISOL
ACTIVITY AMONG AFRICAN AMERICAN WOMEN**

A Thesis Presented for the
Master of Science
Degree
The University of Tennessee, Knoxville

Erica J. Peppers
May 2018

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ABSTRACT

The association between racism-related stress and adverse health outcomes is well documented in the literature. However, there is a dearth of research on the role of gendered racism (i.e., simultaneous experience of racism and sexism) on the health of Black women. Black women's experiences of gendered racism are a unique stressor. Thus, it is plausible that greater frequency and stress associated with experiences of gendered racism contribute to chronic dysregulation of the hypothalamic-pituitary-adrenal (HPA) axis which place Black women at greater risk for negative mental health and physical health outcomes. This study ($N = 54$) aims to utilize an intersectional framework to investigate the influence of subtle gendered racism (i.e., gendered racial microaggressions) on cortisol activity among Black women. Results from simple linear regression analyses indicated that gendered racial microaggressions significantly predicted self-reported mental health but not physical health outcomes. In addition, gendered racial microaggressions significantly predicted waking cortisol activity. However, we did not find an association between gendered racial microaggressions and diurnal slope cortisol activity. This study is among the first to provide empirical support that extends the work on gendered racism and health inequities specific to Black women. Findings provide support for the importance of investigating the role of gendered racism and health outcomes.

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CHAPTER ONE

INTRODUCTION AND LITERATURE REVIEW

Over the past 40 years, heart disease, cancer, and stroke have remained among the top three leading causes of death in the United States (CDC, 2016). Black women are at the greatest risk of cardiovascular disease, stroke, certain types of cancer, and adverse birth outcomes when compared to White women, Hispanic/Latina women, and Asian American women (National Center for Health Statistics, 2015). There is strong evidence that social determinants of health, such as chronic forms of discrimination (i.e., racism) contribute to these health inequities (Jerald, Cole, Ward, & Avery, 2017). However, we are limited in our understanding of how the intersection of racism and sexism (i.e., gendered racism) influences the health of Black women (Jerald et al., 2017). In this study, we investigate the association of gendered racism on the mental and physical health of Black women. First, we review the research on racism as a stressor and the relation between racism-related stress, mental health, and physical health. Next, we explore the relation between racism-related stress and activity of the body's stress system, the *Hypothalamic–Pituitary–Adrenal* (HPA) axis. Then, we highlight the importance of exploring the intersection of racism and sexism (i.e., gendered racism) on the health of Black women.

Racism as a Stressor

There have been several theoretical models developed to highlight the impact of racism and discrimination on the health of people of color. Clark, Anderson, Clark, and Williams (1999) proposed the Biopsychosocial Model of Perceived Racism, which highlights the ways that experiences of racist environmental stimuli activate the body's stress response, which is linked to negative effects on health outcomes over time (Clark et al., 1999). This model provides a useful

framework to investigate the relations between racism and the risk of negative mental health and physical health outcomes (Clark et al., 1999).

Meyer's (2003) Minority Stress Framework is a useful model that defines minority stress as the excess stress to which one is exposed, due to their position as a minority in society. Harrell (2000) developed a model of racism-related stress that identified the multiple ways that racism is experienced as a stressor: (1) racism-related life events (i.e., time-bound stressors that occur across various domains of life experience, such as loan rejection, harassment by police), (2) vicarious racism experiences (i.e., prejudice and discrimination witnessed towards family, close friends, and strangers, such as witnessing the death of an unarmed Black man on the news), (3) daily racism microstressors (i.e., interpersonal slights and exclusion, such as being followed in a store), (4) chronic contextual stress (i.e., limitations and unequal distribution of resources, such as out of date textbooks in inner city schools), (5) collective experiences of racism (i.e., experiences of racism at the group level, such as underrepresentation of people of color in academia, negative or stereotypical portrayals in the media), and (6) the transgenerational transmission of group traumas (i.e., historically oppressive events transmitted across generations, such as slavery of African people). All six racism-related stressors coincide with the three primary sources of stress identified in the stress literature (Wheaton, 1993): episodic stress (direct and vicarious racism experiences), daily hassles (racism microstressors), and chronic strain (chronic-contextual, collective, and transgenerational transmission).

Harrell's (2000) definition of racism microstressors is a useful framework for better understanding how subtle forms of racism and microaggressions are related to negative health outcomes. Present day racism-related stress is experienced as interpersonal forms of racism, such

as racial microaggressions (Sue, Capodilupo, Torino, Bucceri, Holder, Nadal, & Esquilin 2007). Racial microaggressions (Harrell, 2000; Sue et al., 2007) occur in everyday life and occur more frequently than overt forms of racism. Pierce (1995) suggested that during a lifetime, an individual may experience thousands of such encounters that may be perceived as not “serious” enough for most people to confront and thus may not even be recalled unless asked about. According to Pierce (1995), “most microaggressions have to be allowed to pass, to protect one’s time, energy, sanity or bodily integrity” (p. 282). However, Harrell (2000) postulated that the accumulation of these experiences contributes to the overall stress load of the individual and subsequent negative effects on health.

Racism and Health

There is a large body of empirical research that highlights the impact of racism, discrimination, racism-related stress, and racial microaggressions on negative mental and physical health outcomes (Korous, Causadias, & Casper, 2017; Lee & Ahn, 2011; Paradies, 2006; Pascoe & Smart Richman, 2009). For example, in a study of 204 African American women, Perry, Harp, and Oser (2013) demonstrated the deleterious effects of chronic strain directly related to the accumulation of experiences of racial microaggressions at the intersection of race and gender. Prior meta-analyses investigating the relations between discrimination and mental health have found significant small average correlations between racism-related stress and psychological distress among marginalized groups (Lee & Ahn, 2011; Pascoe & Smart Richman, 2009). The first meta-analysis to focus on racism and health specifically for Black Americans revealed that the association between perceived racism and mental health was quite robust (Pieterse, Todd, Neville, & Carter, 2011). Results from Pieterse et al.’s (2011) meta-

analysis indicate a need within the racism-related stress and health literature for greater specificity regarding the influence of specific types of racism (i.e., gendered racism) on the mental health of Black women.

Racism and mental health. There is a large body of research that has explored the detrimental effects of chronic psychosocial stressors on mental health (Berger & Sarnyai, 2015; Williams & Mohammed, 2009; Paradies, 2006; Pascoe & Smart Richman, 2009). However, there are gaps in our understanding of the specifics that underlie the influence of racial stress on health (Berger & Sarnyai, 2015). A widely accepted explanation is that negative mental health begins with a series of negative emotional experiences because of racism, which in turn activates the body's stress response system, resulting in poor mental health outcomes (Berger & Sarnyai, 2015). There has been strong empirical support linking the effects of activating a stress response to metabolic changes, along with behavioral alterations, such as mood changes and cognitive impairment (Juster, McEwen, & Lupien, 2010; Radley et al., 2011). Berger and Sarnyai (2015) reviewed a number of studies that integrated subjective and objective measures to investigate the relations between discrimination and negative mental health outcomes. However, questions remain regarding which specific factors are at work in the biological effects of racial discrimination on the mental health of Black women (Berger & Sarnyai, 2015).

Racism and physical health. Racism-related stress has been described as a social stressor that impacts physical health by activating a set of physiological responses, such as elevated blood pressure, heart rate, and cortisol secretions (Nelson, 2015). Results from prior studies suggest that frequent experiences of discrimination have the potential to set up the body to be physically responsive in distressing social circumstances, which ultimately prompt wear

and tear on the body (Nelson, 2015). Prior research has proposed that health inequities may result partly from stress-related behaviors associated with discrimination (Nelson, 2015).

Previous empirical research has reported mixed findings regarding the impact of discrimination on mental and physical health. On one hand, the impact of discrimination on health outcomes has been more strongly associated with negative mental health outcomes than negative physical health outcomes (Paradies, 2006). On the other hand, Pascoe and Smart Richman (2009) conducted a meta-analysis that concluded stronger differences in overall effects of discrimination on mental health over physical health were not statistically significant. An alternative explanation for the stronger associations of racism-related stress and negative mental health outcomes calls attention to the lagged effect of racism on physical health (Paradies, 2006). For example, chronic racism-related stress has been found to influence chronic health outcomes, such as cardiovascular disease, metabolic illness, and cancer (Lucas, Wegner, Pierce, Lumley, Laurent, & Granger, 2017). However, these illnesses develop slowly over time, thus, making associations between racism and specific diseases difficult to capture. In response to critiques regarding the difficulty in assessing health outcomes using self-report measures, scholars have begun to examine physiological indicators of stress as it relates to specific body systems (Paradies, 2006). Thus, objective measures of health may be able to provide a more accurate understanding of how racism-related stress influences health.

Racism and HPA-Axis Dysregulation

Prior empirical research points to accumulated experiences of racial discrimination as a trigger that activates the body's *Hypothalamic-Pituitary-Adrenal* (HPA) axis, and subsequent secretion of cortisol from the adrenal cortex (Korous et al., 2017). Increases in cortisol allow an

individual to adapt to stress. However, chronic activation of the HPA axis has been associated with long term negative health outcomes due to the altered structure and function of an over activation of the body's stress response system (Clark et al., 1999; Harrell et al., 2011; Korous et al., 2017). In the first meta-analysis on racial discrimination and cortisol activity, Korous et al. (2017) noted the complexity of measuring the association between discriminatory experiences and cortisol activity. Previous research highlights gaps in our understanding of the intersections of racism, sexism, and health (Korous et al., 2017). For example, while Black men have been found to report higher levels of discrimination than Black women, stronger associations between the effects of discrimination on the physical and mental health of Black women have been documented in the literature (Williams & Mohammed, 2009). These discrepancies highlight the importance of research that specifically focuses on the unique experiences of gendered racism for Black women.

Within the past decade, researchers have increased their efforts to determine the psychological antecedents of the body's responses to stressful experiences (Rohleder, Chen, Wolf, & Miller, 2008). Most recently, researchers have proposed that environmental stressors stimulate specific cognitive, emotional, and biological responses to meet the demands of the environment (Rohleder et al., 2008). The body responds to internal and external stressors via the HPA axis (Gruenewald, Kemeny, Aziz, & Fahey, 2004). The HPA axis is well-adapted to deal with acute, time-limited stressors (Jackson, Knight, & Rafferty, 2010). However, evidence suggests that frequent or chronic activation of this system adversely influences cognitive, metabolic, and immune system functioning (Miller, Chen, & Zhou, 2007; Jackson et al., 2010).

Cortisol is a hormonal biomarker of HPA axis functioning with a relatively stable diurnal rhythm (Gruenewald et al., 2004). Cortisol is typically known to have a sharp increase within 30 minutes of waking up in the morning to prepare for the day's events a steep decline by mid-morning, and a gradual decline over the course of the day for immune and tissue repair (Miller, Chen, & Zhou, 2007; Pruessner, Wolf, Helhammer, Buske-Kirschbaum, von Auer, Jobst, Kaspers, Kirschbaum, 1997). When compared to healthy controls, reduced waking cortisol levels have been associated with several negative mental health and physical health outcomes such as cardiovascular disease, depression, chronic pain, and chronic fatigue, (Adam, Quinn, Tavernier, McQuillan, Dahlke, & Gilbert, 2017; Fries, Dettenborn, Kirschbaum, 2009).

Empirical research suggests that greater experiences of discrimination are associated with an overall lowering of the diurnal cortisol levels throughout the day for various racial/ethnic minority groups (Kaholokula, Grandinetti, Keller, Nacapoy, Kingi, & Mau, 2012; Zeiders, Doane, & Roosa, 2012). For example, Skinner et al. (2011) found that greater experiences of discrimination among a sample of 127 Black and 148 White young adults predicted flatter diurnal slopes for Black participants, which indicated greater HPA axis dysregulation. In another study comparing African American and Hispanic women, Suglia, Staudenmayer, Cohen, Enlow, Rich-Edwards, and Wright (2010) found that African American women had flatter diurnal slopes at the end of the day compared to Hispanic women, even after controlling for socioeconomic status. DeSantis, Adam, Hawkley, Kudielka, and Cacioppo (2015) also found that African American women were more sensitive to the effects of stress on the cortisol diurnal slopes compared to women of other racial/ethnic groups. In another study, Lee et al. (2018) explored gender differences in the body's response to discrimination-related stress. The authors

demonstrated that Black women in their study were found to be more prone to a flatter diurnal cortisol slope when compared to their Black male counterparts (Lee et al., 2018). The consequences of flatter diurnal cortisol rhythms include an association with higher evening blood pressure, coronary calcification, and a predisposition to risk factors for cardiovascular disease (Cohen, Doyle, & Baum, 2006; DeSantis et al., 2015; Skinner et al., 2011; Martin, Bruce, Fisher, 2012). This suggests that flatter cortisol rhythms may clarify ways in which social-environmental stressors influence health inequities (Suglia et al., 2010). Taken together, these studies add to the body of knowledge about the pattern of diurnal cortisol levels throughout the day for various racial/ethnic minority groups; however, the literature is lacking in empirical research that specifically explores Black women's experiences with the intersection of racism and sexism.

Gendered Racism and Health

Prior research on the impact of discrimination on health has tended to focus on race/ethnicity alone, without consideration for intersections with gender (Lewis, Cogburn, & Williams, 2015). These one-dimensional approaches fail to attend to the unique way in which occupying multiple socially disadvantaged statuses shape experiences of discrimination (Lewis et al., 2015; Cole, 2009). For example, Crenshaw (1989) argued that Black women experience race and gender discrimination in a way that is not amenable to teasing apart. Black women are instead impacted by the combined effect of experiences of both racism and sexism, as opposed to the sum of race and sex discrimination (Crenshaw, 1989). Gendered racism refers to the simultaneous experience of both racism and sexism experienced by women of color (Essed, 1991).

There is a small, but growing body of research on the influence of gendered racism on the health of Black women. Thomas, Speight, and Witherspoon (2008) conducted a study with Black women to explore the link between gendered racism and psychological distress. They found that greater experiences of gendered racism were also related to greater psychological distress. In addition, they found that the relation between gendered racism and psychological distress was partially mediated by coping styles associated with heightened distress (i.e., avoidant coping in an effort to mitigate the uncontrollable nature of gendered racism; Thomas et al., 2008). In another study, Szymanski and Lewis (2016) found that disengagement coping mediated the relations between gendered racism and psychological distress. Although these studies were helpful in illuminating the association between gendered racism and mental health, there are fewer studies that have investigated the link between gendered racism and physical health.

Recent empirical research has found that even subtle forms of gendered racism (i.e., gendered racial microaggressions) negatively influence the health of Black women (Lewis, Williams, Peppers, & Gadson, 2017). For example, Lewis et al. (2017) conducted one of the first studies to investigate the influence of gendered racial microaggressions on the health of Black women. In a study of 231 adult Black women, Lewis et al. (2017) found that greater experiences of gendered racial microaggressions significantly predict both self-reported mental and physical health outcomes.

The Present Study

There is burgeoning research on the importance in studying the influence of intersections of both racism and sexism on the health of Black women. In addition, given what we know regarding the role of the body's physiological stress response system, it is important to

investigate the potential role of gendered racism in affecting objective biomarkers of stress, such as cortisol, on the health of Black women. The present study seeks to test the following research hypotheses:

Hypothesis 1: Gendered racial microaggressions will significantly predict self-reported mental and physical health outcomes: (1a) The frequency and stress of gendered racial microaggressions will significantly predict mental health, such that greater experiences of gendered racial microaggressions will be related to lower mental health outcomes. (1b) The frequency and stress of gendered racial microaggressions will significantly predict physical health, such that greater experiences of gendered racial microaggressions will be related to lower physical health outcomes.

Hypothesis 2: Gendered racial microaggressions will significantly predict dysregulated cortisol activity: (2a) The frequency and stress of gendered racial microaggressions will significantly predict waking cortisol levels, such that greater experiences of gendered racial microaggressions will be related to lower waking cortisol levels. (2b) The frequency and stress of gendered racial microaggressions will significantly predict diurnal slope, such that greater experiences of gendered racial microaggressions will be related to lower diurnal slope.

CHAPTER TWO

METHOD

Participants

The initial sample comprised 56 participants who completed the survey and saliva sample protocol. However, two participants were omitted from the sample because their salivary cortisol levels were outside the range of possible values, indicating the data was not properly collected and may have been contaminated (Salimetrics, 2016). The final sample was 54 Black women undergraduate students. Of the participants, a majority identified as African American or Black (85%) and 96% were born in the United States. In addition, the remainder of the participants identified as biracial/multiracial (13%) or other (2%; i.e., Egyptian, Kenyan). Participants ranged in age from 18 to 22 years, with a mean age of 19 ($SD = .94$).

Measures

Gendered racial microaggressions. Gendered racial microaggressions were assessed using the Gendered Racial Microaggressions Scale (GRMS; Lewis & Neville, 2015), which consists of 26 items and was used to assess the frequency and stress appraisal of nonverbal, verbal, and behavioral negative racial and gender slights experienced by Black women. This instrument was selected based on prior support for construct validity, including significant associations between the GRMS and racial microaggressions, experiences of sexist events, and psychological distress (Lewis & Neville, 2015). Participants in this study were asked to report the frequency of gendered racial microaggressions they have experienced in their lifetime on a 6-point Likert-type response format ranging from 0 (*never*) to 5 (*once a week or more*). In addition, participants were also asked to report the stress appraisal of each gendered racial

microaggression on a 6-point Likert-type response format ranging from 0 (*This has never happened to me*) to 5 (*Extremely stressful*). A sample item includes, “I have been perceived to be an ‘angry black woman.’” Higher total mean scores indicated a greater frequency and stress appraisal of gendered racial microaggressions (Lewis & Neville, 2015). Previous research reported reliability coefficients for the GRMS frequency and stress appraisal subscales as .92 and .93, respectively (Lewis & Neville, 2015). In the current study, the Cronbach’s alpha coefficients for the GRMS frequency and GRMS Stress subscales were both .94.

Mental health and physical health. The 12-item Short Form Health Survey-Version 2 (SF-12v2; Ware, Kosinski, & Keller, 1996) was used to assess self-reported mental and physical health. The measure includes two subscales: Mental Health (six items: e.g., “How much of the time during the last 4 weeks have you felt calm and peaceful?”) and Physical Health (six items: e.g., “During the past 4 weeks, how much did pain interfere with your normal work?[including both work outside the home and housework]”). We calculated a total sum score for each subscale, a method that has been used in previous research with African American populations (Guyll, Cutrona, Burzette, & Russell, 2010). Items were scored such that higher scores on the mental health subscale indicate positive mental health (e.g., little or no psychological distress) and higher scores on the physical health subscale indicated positive physical health (e.g., little or no reported limitations in physical functioning; Maruish, 2012). Previous research with an African American sample has reported reliability coefficients for the mental health subscale and physical health subscale of .76 and .81, respectively (Cernin, Cresci, Jankowski, & Lichtenberg, 2010). The reliability coefficients for the mental health and physical health subscale in the present study were .87 and .78, respectively.

Cortisol. The diurnal rhythm of cortisol typically peaks shortly after waking and continues to fall throughout the day (Suglia et al., 2010). To capture the full diurnal rhythm, prior research suggests taking samples upon waking and at a specific number of hours after waking up, but covering the rest of the day (Rohleder & Nater, 2009). It is further advisable that a participant's diurnal slope is assessed for two consecutive days at the minimum (Rohleder & Nater, 2009). Participants were instructed to collect a saliva sample three times a day for two consecutive days (Time 1: waking cortisol within 30 minutes of waking in the morning, Time 2: four hours after waking in the morning, Time 3: eight hours after waking in the morning). Cortisol means were calculated by taking the average cortisol across Day 1 and Day 2 at each saliva sample collection point (at waking, four hours post waking, and eight hours post waking (Roe, Thompson, Roe, Aspinall, Brewer, Duff, Miller, Mitchell, & Clow, 2013). Diurnal slope was calculated using the difference between waking cortisol level and cortisol concentration at eight hours post waking (Roe et al., 2013). Mean cortisol level values were calculated using the average of Study Day 1 and Study Day 2 values for waking cortisol (Time 1), four hours post waking (Times 2), and eight hours post waking (Time 3).

Procedure

We obtained Institutional Review Board (IRB) approval prior to participant recruitment. We recruited participants using a variety of methods. First, the survey was advertised on the university's online participant subject pool (SONA research systems) for the Psychology Department to recruit Black women from various undergraduate general psychology courses in exchange for course credit. Interested individuals accessed the recruitment information through the SONA system to sign up for the study. We also recruited participants using purposeful

sampling of Black women college students at the university by distributing flyers on campus and encouraging individuals to take part in our study.

Participation in this study involved completing an online survey in-person in the laboratory. A research assistant met each participant in the lab and provided an overview of the study. Data was collected as a part of a larger study on the daily gendered racism experiences of Black women. After reading the informed consent and agreeing to participate in the study, participants completed a set of questionnaires online via a Qualtrics survey, which took approximately 30 minutes to complete. This initial survey was considered Day 0 of the study and included surveys to assess participants' experiences of gendered racial microaggressions, self-reported mental health, and self-reported physical health. Participants in this study also received a saliva self-collection kit that included six SalivaBio oral swabs, six swab storage tubes, and a detailed instruction sheet, all provided by Salimetrics, Inc. This kit was used to collect a small saliva sample in the privacy of the participants' home, three times a day, at four-hour intervals for two consecutive days (Day 1 and Day 2 of the study). Each tube was pre-affixed with labels so that participants could document the date and time of their saliva sample collection. Participants were asked to return a total of six frozen samples to the research staff.

Data Analytic Plan

Drawing on methodologies described by Roe et al. (2012), cortisol samples were assayed using an Expanded Range High Sensitivity Salivary Cortisol Enzyme Immunoassay Kit (Salimetrics, 2016). Cortisol levels were assessed using a Thermo Scientific Multiscan Ascent plate reader using Ascent software (Version 2.6), which automatically adjusts the cortisol values using logarithmic transformation to adjust for a possible skewed distribution of daily cortisol, as

recommended in the empirical literature (Adam, Hawkley, Kudielka, & Cacioppo, 2006; Champaneri et al., 2012; Hajat et al., 2010; Wang et al., 2014). Mean cortisol level values were calculated using the average of Study Day 1 and Study Day 2 values for waking cortisol (Time 1), four hours post waking (Time 2), and eight hours post waking (Time 3). The diurnal slope was calculated using the difference in mean measurements for waking cortisol and evening cortisol across Study Day 1 and Day 2. In order to test Hypotheses 1 and 2, we conducted a series of simple linear regressions to test whether GRMS (frequency and stress appraisal) predicted each of the four outcome variables of interest (mental health, physical health, average waking cortisol, and average diurnal slope). All statistical analyses were completed using SPSS Version 23 (IBM Corp, Armonk, NY). Statistical significance was assessed at $p < .05$.

CHAPTER THREE

RESULTS

Preliminary Analyses and Descriptive Statistics

Out of the final sample of 54 participants who were included in the analysis, a small amount of missing data remained. Analysis of the patterns of missing data revealed that the missing data for GRMS items ranged from 4% to 9%. All other measures in this study (mental health, physical health, waking cortisol, and diurnal slope) had 0% missing cases. Given the very small amount of missing data (less than 10%), we used available case analyses procedures, wherein scores are calculated without imputation of values, which has been shown to produce similar results to multiple imputation methods (Parent, 2013). The G-power analysis program (G*Power 3.1); (Faul, Erdfelder, Buchner, & Lang, 2009) was used to determine the appropriate sample size. We assumed an effect size of 0.15, an alpha (α) of 0.05 and beta of (1- β) of 0.80. Results of the power analysis indicated an appropriate sample size of 43 participants, thus the sample size had enough power to detect adequate effect sizes.

Descriptive statistics indicated the waking cortisol mean ($\mu\text{g/dL}$) for the sample ($N = 54$) was 0.31 ($SD = 0.15$), with the diurnal slope mean at -0.13 ($SD = 0.19$) (see Table 1). The self-reported GRMS-stress mean score was 2.59 ($SD = 0.99$) and GRMS-frequency mean score was 2.50 ($SD = 0.15$) (see Table 1). The mental health mean score was 18.90 ($SD = 0.68$) and the physical health mean score was 21.19 ($SD = 0.51$) (see Table 1). The association between variables was tested using Pearson's Product Moment bivariate correlations. The association between GRMS-frequency, GRMS-stress, mental health, physical health, waking cortisol, and diurnal slope for each participant is shown in Table 1. We found that GRMS-stress was

significantly negatively correlated with mental health ($r = -.44, p < .01$) and significantly negatively correlated with waking cortisol ($r = -.33, p < .05$). In addition, GRMS-frequency was significantly negatively correlated with mental health ($r = -.42, p < .01$) and significantly negatively correlated with waking cortisol ($r = -.29, p < .05$). There was a significant positive correlation between mental health and physical health ($r = .42, p < .01$). In addition, there was a significant positive correlation between mental health and waking cortisol ($r = .30, p < .05$). There were no significant correlations between GRMS-frequency or stress and diurnal slope.

Primary Analyses

The first research hypothesis stated that GRMS will significantly predict self-reported mental and physical health outcomes. To test this hypothesis, we conducted a series of four simple linear regression analyses. First, we conducted two regressions with GRMS-stress or GRMS-frequency as the predictor variables and mental health as the outcome variable. Then, we conducted two regressions with GRMS-stress or frequency as the predictor variables and physical health as the outcome variable. The results indicated that GRMS-stress significantly predicted mental health ($\beta = -.09$), $t(47) = -3.35, p < .01$, and also explained a significant proportion of the variance in mental health ($R^2 = .18$), $F(1, 47) = 11.19, p < .01$). In addition, GRMS-frequency significantly predicted mental health ($\beta = -.09$), $t(50) = -3.23, p < .01$, and also explained a significant proportion of the variance in mental health ($R^2 = .16$), $F(1, 50) = 10.41, p < .01$) (See Table 2). There was no evidence that GRMS (stress or frequency) significantly predicted physical health (See Table 3).

The second research hypothesis stated that GRMS will significantly predict waking cortisol and diurnal slope. To test this hypothesis, we conducted a series of four simple linear

regression analyses. First, GRMS (frequency and stress) was entered as the predictor variable and waking cortisol was entered as the outcome variable. The results indicated that GRMS-stress significantly predicted waking cortisol ($\beta = -.002$), $t(47) = -2.36$, $p < .05$, and also explained a significant proportion of the variance in mental health ($R^2 = .09$), $F(1, 47) = 5.58$, $p < .05$) (See Table 4). In addition, GRMS-frequency significantly predicted waking cortisol ($\beta = -.002$), $t(50) = -2.11$, $p < .05$, and also explained a significant proportion of the variance in mental health ($R^2 = .06$), $F(1, 50) = 4.46$, $p < .05$) (See Table 3). Then, GRMS (stress and frequency) was entered as the predictor variable and diurnal slope was entered as the outcome variable. However, there was no evidence that GRMS (stress nor frequency) significantly predicted diurnal slope (see Table 5).

CHAPTER FOUR

DISCUSSION

The purpose of the present study was to utilize an intersectional framework to investigate the influence of subtle gendered racism (i.e., gendered racial microaggressions) on cortisol activity among Black women. We also aimed to investigate whether experiences of gendered racial microaggressions would be associated with poor self-reported mental health and poor self-reported physical health outcomes. Findings from this study enhance the racism and health literature by expanding our understanding of the unique influence of subtle gendered racism on health outcomes for Black women.

The first hypothesis exploring whether gendered racial microaggressions would significantly predict self-reported mental and physical health outcomes was partially supported. In particular, the frequency and stress of gendered racial microaggressions significantly predicted mental health. As expected, greater experiences of gendered racial microaggressions was related to lower mental health outcomes. We also anticipated that the frequency and stress of gendered racial microaggressions would significantly predict physical health. However, greater experiences of gendered racial microaggressions were not found to significantly predict lower physical health outcomes. Taken together, these findings represent similar patterns in the literature where discrimination has been more strongly associated with negative mental health outcomes than negative physical health outcomes (Paradies, 2006). Although, the strong associations between the frequency and stress appraisal of gendered racial microaggressions and mental health found in this study are consistent with findings of past research exploring the

impact of gendered racism on experiences of psychological distress for Black women (Lewis & Neville, 2015; Lewis et al., 2017; Thomas et al., 2008).

We found it striking that experiences of gendered racial microaggressions did not significantly predict lower physical health for participants in this study. It is possible that the self-reported physical health measure we used did not adequately capture health for our sample. A majority of our sample (91%) consisted of undergraduate students between the ages of 18 – 19 years old. Thus, it is likely that given our sample of emerging adults, the lagged effect of racism on physical health may make it difficult to capture limitations due to chronic health conditions that typically develop over a longer period of time (Paradies, 2006). It is possible that a different measure of physical health for emerging adults might more accurately capture self-reported health for this study. Emerging young adults have been theorized as at-risk for an increase in discrimination during this phase of life transition from familial contexts to spaces that are more ethnically diverse (Arnett & Brody, 2008; Lee et al., 2018). Thus, further exploration of the association between racism and health for emerging young adults in this critical developmental period may prove beneficial (Lee et al., 2018).

The second hypothesis investigating whether gendered racial microaggressions would significantly predict dysregulated cortisol activity was partially supported. Particularly, results indicated that greater frequency and stress of gendered racial microaggressions significantly predicted lower waking cortisol levels. Previous studies that utilized a single measure of waking salivary cortisol found similar results that link low levels of waking cortisol to high levels of PTSD (Anisman, Griffiths, Matheson, Ravindran, & Merali, 2001; de Kloet, Vermetten, Heijnen, Geuze, Lentjes, & Westenberg, 2007; Pineles, Rasmusson, Yehuda, Lasko, Macklin, Pitman,

Orr, 2013). Findings in the present study provide promising preliminary evidence that supports prior research and may extend our knowledge regarding the link between discrimination and cortisol activity in African Americans (Lee et al., 2018). Further studies are warranted to determine whether experiences of gendered racial microaggressions have a specific effect on waking cortisol levels for Black women that mimic the body's response to trauma.

Greater frequency and stress of gendered racial microaggressions did not significantly predict a lower diurnal slope for participants in this study, which was unexpected. It is likely that dysregulated HPA axis activity is predicted by experiences of gendered racism, although, this was not supported in our study with emerging young adult Black women. There could be additional factors that influence diurnal slope that are important to consider when exploring the link between experiences of gendered racism and diurnal slope patterns. For example, Oliver, Datta, and Baldwin (2017) found that African American undergraduates at a predominantly White institution reported greater adaptability to effectively cope with stress (i.e., resilient coping). These findings suggest that exposure to chronic psychosocial stressors may promote greater perceived self-efficacy in coping with multiple stressors (Oliver et al., 2017). Empirical literature has found that African Americans report greater resilience in the face of chronic stress (Keyes, 2009). Thus, it is plausible that greater resilient coping from chronic stressors could maintain healthy HPA axis activity (Oliver et al., 2017). Future research should consider exploring coping strategies as a mediating variable in the relations between gendered racial microaggressions and diurnal slope.

Limitations

The majority of our sample was undergraduate psychology students, which is a limitation of our study. Our findings represent the unique experiences of gendered racial microaggressions among a group of emerging young adult Black women in college. Our study was also limited by the small sample size. The racism and health literature could benefit from longitudinal studies, with greater sample sizes, that follow the trajectory of experiences of gendered racial microaggressions of Black women over their lifetime (Korous et al., 2017). Longitudinal studies may also better capture the long-term impact of gendered racial microaggressions on the health of Black women. In addition, future studies that investigate the impact of gendered racism on health using a more diverse community-based sample would contribute to a better understanding of the role of gendered racism on health inequities among Black women across the lifespan.

Another potential limitation of the present study is the use of a single measure of waking cortisol level (Pineles et al., 2013). Waking cortisol has also been assessed in the literature to reflect the full morning awakening curve (Pineles et al., 2013). Future research that explores the link between gendered racism and waking cortisol level may find stronger associations when examining the full cortisol awakening response (CAR) (Pineles et al., 2013). It is important to note that although the CAR was not specifically measured in this study, the findings of our study still provides preliminary support for HPA axis activity in response to gendered racism. It is possible that gendered racial microaggressions did not predict diurnal slope due to limitations in the participant's ability to provide saliva samples within the exact four-hour time frame, as indicated in the protocol. Thus, there may have been inconsistent variations in data at each time point due to varying participant salivary cortisol data collection.

Implications for Research and Practice

New insights into links between experiences of gendered racism and health were discovered in the present study through the first intersectional approach that measures cortisol activity as an objective indicator of stress. Our study supports previous research in using quantitative measures of gendered racial microaggressions, but has added a nuanced understanding of potential ways that gendered racism affects health (Lewis et al., 2017). Findings from the present study provide preliminary support of one explanation of the association between specific forms of gendered racism and health: the regulation of the HPA axis as indicated by dysregulated cortisol patterns. The significant association between experiences of gendered racial microaggressions and low waking cortisol levels in our study could justify further exploration to confirm this pattern in CAR. Specifically, researchers have highlighted the potential role of chronic stress in predicting high versus low CAR and ultimately hypoactive HPA axis activity (Chida & Steptoe, 2009; Fries et al., 2009).

It would also be important to explore potential moderators for coping with gendered racism-related stress in future research. Cortisol can be considered a “starting point” of a series of events that could potentially lead to disease risk (Korous et al., 2017, p. 98). The literature on racism-related stress could benefit from multisystem approaches in order to clarify our understanding of physiological indicators of gendered racial microaggressions (Korous et al., 2017). In addition, although this study followed recommended practice in cortisol sampling there remains no widely accepted consensus in standardized practices for the use of diurnal cortisol as an outcome measure (Ryan, Booth, Spathis, Mollart, & Clow, 2016). Thus, additional research exploring the validation of the use of diurnal cortisol as an outcome measure is needed.

The strong association between greater experiences of gendered racial microaggressions and mental health indicated in this study suggest avenues for unique points of intervention and prevention of negative mental health outcomes (Adam et al., 2017; Fries, Dettenborn, Kirschbaum, 2009). Experiences of racial discrimination are prevalent among African Americans, and more so in the current sociopolitical environment. Thus, it is very important that mental health clinicians incorporate an awareness of serious long-term consequences of frequent exposure to gendered racial microaggressions in treatment planning and conceptualization. In addition, it is important for clinicians to validate client's experiences of gendered racism and help their clients develop effective tools to intervene. For example, one possible effective intervention for Black women to reduce the stress of gendered racism could be a culturally-adapted mindfulness-based stress reduction intervention (Woods-Giscombé & Gaylord (2014).

The findings of the present study extend our understanding of ways in which gendered racism may directly impact the health of Black women. This study is consistent with prior evidence that documents the associations between racial discrimination and cortisol (Korous et al., 2017). As a result of this study, we hope to inform future research to fine tune rigorous methodology that effectively captures the influence of gendered racism and health. It is important to better understand the role of gendered racism on health to inform efforts to reduce and eliminate health inequities among Black women.

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APPENDIX

Table 1: Intercorrelations Between All Study Variables

Variables	1	2	3	4	5	6	<i>M</i>	<i>SD</i>	α
1. GRMS-Stress	---	.77**	-.44**	-.14	-.33*	.21	2.59	0.99	.94
2. GRMS-Frequency		---	-.42**	-.18	-.29*	.22	2.50	1.06	.94
3. Mental Health			---	.42**	.30*	-.25	18.80	5.00	.87
4. Physical Health				---	.13	-.11	21.19	3.71	.78
5. Waking Cortisol					---	-.87**	0.31	0.15	---
6. Diurnal Slope						---	-0.13	0.19	---

Note.

GRMS-Stress = gendered racial microaggression stress appraisal subscale;

GRMS-Frequency = gendered racial microaggression frequency subscale;

* $p < .05$ ** $p < .01$

Table 2: Linear Regressions Examining Gendered Racial Microaggressions as a Predictor of Mental Health

Predictor Variable	Outcome Variable	<i>B</i>	β	<i>t</i>	R^2	<i>F</i>	<i>df</i>	<i>p</i>
GRMS Stress								
	Mental Health	-.09	-.44	-3.35	.18	11.19	1, 47	.00**
GRMS Frequency								
	Mental Health	-.09	-.42	-3.23	.16	10.41	1, 50	.00**

Note. *B* and *t* reflect values from the final regression equation. *df*= degrees of freedom.

***p* < .001

Table 3: Linear Regressions Examining Gendered Racial Microaggressions as a Predictor of Physical Health

Predictor Variable	Outcome Variable	<i>B</i>	β	<i>t</i>	R^2	<i>F</i>	<i>df</i>	<i>p</i>
GRMS Stress								
	Physical Health	-.02	-.14	-.93	-.003	0.87	1, 47	.35
GRMS Frequency								
	Physical Health	-.03	-.18	-1.32	.01	1.74	1, 50	.19

Note. *B* and *t* reflect values from the final regression equation. *df*= degrees of freedom.

Table 4: Linear Regressions Examining Gendered Racial Microaggressions as a Predictor of Waking Cortisol

Predictor Variable	Outcome Variable	<i>B</i>	β	<i>t</i>	R^2	<i>F</i>	<i>df</i>	<i>p</i>
GRMS Stress								
	Waking Cortisol	-.002	-.326	-2.36	.09	5.58	1, 47	.02*
GRMS Frequency								
	Waking Cortisol	-.002	-.286	-2.11	.06	4.46	1, 50	.04*

Note. *B* and *t* reflect values from the final regression equation. *df*= degrees of freedom.

**p* < .05

Table 5: Linear Regressions Examining Gendered Racial Microaggressions as a Predictor of Diurnal Cortisol Slope

Predictor Variable	Outcome Variable	<i>B</i>	β	<i>t</i>	R^2	<i>F</i>	<i>df</i>	<i>p</i>
GRMS Stress								
	Diurnal Slope	.001	.206	1.44	.02	2.08	1, 47	.16
GRMS Frequency								
	Diurnal Slope	.002	.215	1.56	.03	2.42	1, 50	.13

Note. *B* and *t* reflect values from the final regression equation. *df*= degrees of freedom.

VITA

Erica Peppers was born on January 11, 1982, in Huntsville, Alabama. She attended the Academy for Academics and Arts for primary school and middle school, J.O. Johnson High School and North High School for secondary school. She pursued her degrees at the University of Alabama at Birmingham, and graduated with the B.A. in Spanish and a B.S. in Psychology in 2005. Upon graduation, she served the community of Birmingham through various roles in which her bilingual skills could be used. She then enrolled at the University of Alabama at Birmingham, in 2006, where she earned a Master's in Public Health in 2008. Thereafter, she moved to the Texas-Mexico border where she studied health disparities affecting Latinx populations through a Center for Disease Control and Prevention sponsored program; Hispanic Serving Health Professions Schools (HSHPS). After completing two research fellowships through HSHPS, she moved to Houston, Texas where she served in the department of Health Disparities Research as Senior Research Coordinator. She transitioned to Baylor College of Medicine to serve as Senior Research Coordinator at the Dan L. Duncan Cancer Center to support the conduct of clinical trials in conjunction with Harris Health Systems. In 2015, Ms. Peppers was admitted into Counseling Psychology Ph.D. program in the Psychology Department at the University of Tennessee. During this time, she was a graduate research assistant with the Gendered Racism and Health Disparities Lab, under the direction of Dr. Jioni A. Lewis, where she was granted research awards to support the conduct of research impacting the mental and physical health of African American women. As part of this research lab, she has gained experience presenting her research at national conferences, including presenting at several multicultural psychology conferences, such as the Columbia University Winter Roundtable Conference on

Cultural Psychology and Education, the APA Multicultural Conference and Summit, and the Association of Black Psychologists. She has also made contributions as third author on a publication in the Journal of Counseling Psychology on the impact of gendered racism on the health African American women. Erica has served the community of Knoxville, TN with her bilingual skills as a former volunteer at the immigration legal clinic at UT School of Law. She is currently partnering with a local non-profit, Centro Hispano de East Tennessee to address barriers in access to education for Latinx youth and young adults.